

Claims

[c1] **What is claimed is:**

1. An echo cancellation device for use in a full duplex communication system, wherein the full duplex communication system comprises a transmitter for transmitting a transmit signal and a receiver for receiving a receive signal, the echo cancellation device comprising:
a filter for outputting a filtering signal according to the transmit signal;
an echo cancellation circuit electrically coupled to the filter for outputting an echo cancellation signal according to the filtering signal; and
at least an echo cancellation resistor electrically coupled to the transmitter, the receiver, and the echo cancellation circuit.

[c2] 2. The echo cancellation device of claim 1, wherein the echo cancellation signal corresponds to the transmit signal.

[c3] 3. The echo cancellation device of claim 1 further comprising a digital-to-analog converter.

[c4] 4. The echo cancellation device of claim 1, wherein the

filter further comprises a digital low pass filter.

- [c5] 5. The echo cancellation device of claim 1, wherein the filter further comprises an analog low pass filter.
- [c6] 6. The echo cancellation device of claim 1 further comprising an echo residue detection circuit for outputting a control signal to control at least a characteristic of the filter according to an echo residue received by the receiver.
- [c7] 7. The echo cancellation device of claim 6, wherein the filter is a finite impulse response (FIR) filter and the characteristic is at least a coefficient of the FIR filter.
- [c8] 8. The device of claim 6, wherein the filter is a infinite impulse response (IIR) filter and the characteristic is at least a coefficient of the IIR filter.
- [c9] 9. The echo cancellation device of claim 6, wherein the filter is a resistor–capacitor (RC) network low pass filter and the characteristic is the resistance of the resistor or the capacitance of the capacitor.
- [c10] 10. An echo cancellation device for use in a full duplex communication system, wherein the full duplex communication system comprises a transmitter for transmitting a transmit signal and a receiver for receiving a receive

signal, the echo cancellation device comprising:

- a filter for outputting a filtering signal according to the transmit signal;
- an echo cancellation circuit electrically coupled to the filter for outputting an echo cancellation signal according to the filtering signal;
- at least an echo cancellation resistor electrically coupled to the transmitter, the receiver, and the echo cancellation circuit; and
- an echo residue detection circuit for outputting a control signal to adjust the filter according to an echo residue received by the receiver.

- [c11] 11. The echo cancellation device of claim 10, wherein the echo cancellation signal corresponds to the transmit signal.
- [c12] 12. The echo cancellation device of claim 10 further comprising a digital-to-analog converter.
- [c13] 13. The echo cancellation device of claim 10, wherein the filter further comprises a digital low pass filter.
- [c14] 14. The echo cancellation device of claim 13, wherein the digital low pass filter is a finite impulse response (FIR) filter and the FIR filter is adjusted through adjusting at least a coefficient of the FIR filter.

- [c15] 15. The echo cancellation device of claim 13, wherein the digital low pass filter is a infinite impulse response (IIR) filter and the IIR filter is adjusted through adjusting at least a coefficient of the IIR filter.
- [c16] 16. The echo cancellation device of claim 10, wherein the filter further comprises a RC network filter.
- [c17] 17. The echo cancellation device of claim 16, wherein the RC network filter further comprises a resistor.
- [c18] 18. The echo cancellation device of claim 17, wherein the resistor is implemented by a MOS transistor.
- [c19] 19. The echo cancellation device of claim 18, wherein the RC network filter is adjusted through adjusting a gate voltage applied to the gate electrode of the MOS transistor.
- [c20] 20. The echo cancellation device of claim 16, wherein the RC network filter comprises a capacitor.
- [c21] 21. The echo cancellation device of claim 20, wherein the capacitor comprises a parasitic capacitor.
- [c22] 22. The echo cancellation device of claim 20, wherein the RC network filter is adjusted through adjusting the capacitance of the capacitor.

